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Breakthrough Concepts

Breakthrough Concepts Agenda

An Innovative Approach for Screening Marine Microalgae for Maximum Flue Gas CO₂ Biofixation Potential

Michael Huesemann (Pacific Northwest National Laboratory), Richard Bartha, Tom Hausmann, John R. Benemann

Accelerating the Rate of Mineral Carbonation

S. J. Gerdemann (Albany Research Ctr), D. C. Dahlin, W. K. O'Connor L. R. Penner

Bioconversion of Carbon Dioxide in Power Plant Stack Gases to Achieve Cost-effective Carbon Sequestration

Rakesh Govind (Univ. of Cincinnati), Rajit Singh

Evaluation of Southern Quebec (Canada) mine residues of Serpentine for CO₂ Sequestration by Mineral Carbonation; Preliminary Results

Francois Huot (Geo-Conseils TB), Georges Beaudoin, Rejean Hebert, Marc Constantin, Gilles Bonin, Greg M. Dipple

Selection of Optimal Microalgae Species for CO₂ Sequestration

Eiichi Ono (Univ. of Arizona), Joel L. Cuella

Geochemical Mechanisms of Serpentine and Olivine Carbonation

George D. Guthrie (LANL), J. William Carey, Peter C. Lichtner, Elias P. Rosen, Hans J. Ziock

Basalt, Carbonate Mineralization, and CO₂ Sequestration

Stephen Reidel (Pacific Northwest Nat'l Lab.), Vernon Johnson, Frank Spane, Anita Ho, Peter McGrail, Todd Schaef

Using CaO- and MgO-rich Industrial Waste Streams for Carbon Sequestration

Joshuah Stolaroff (Carnegie Mellon), David Keith, Greg Lowry

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Breakthrough Concepts (continued)

Capture of Carbon Dioxide from Flue Gas Using a Cyclic Alkali Carbonate-based Process

David A. Green (Research Triangle Institute), Raghbir P. Gupta, Brian S. Turk, William J. McMichael, Jeffrey W. Portzer, Douglas P. Harrison

Carbonation of Calcium and Magnesium Silicates for Safe and Permanent CO₂ Sequestration

James Blencoe, (ORNL), Lawrence Anovitz, Donald Palmer, James Beard

Capture Sequestration

Capture Sequestration Agenda

Zero Emission Membrane Piston Engine System (ZEMPES)

E. Yantovski (Independent Researcher/Germany), M. Shokotov

Experimental Evaluation of Packing for CO₂ Scrubbing by Aqueous Alkanolamines

Gary T. Rochelle (Univ. of Texas), Ian Wilson

Innovative Stripper Configurations to Reduce the Energy Cost of CO₂ Capture

Gary T. Rochelle (Univ. of Texas)

Optimization of a SOFC/GT System with CO₂ Capture

Bjorn Fredriksson Moller (Lund Institute of Technology), Jaime Arriagada, Mohsen Assadi

Development of Low-Cost Fly Ash Derived Sorbents to Capture CO₂ from Flue Gas of Power Plants

M. Mercedes Maroto-Valer (Penn State University), Zinzhi Zhang, Zhe Lu

Capturing and Sequestering Flue-Gas CO₂ Using a Wet Limestone Scrubber

*Greg H. Rau (Inst. of Marine Sciences, Univ. of CA), Devin G. Knauss, Ken Caldeira
Energy and Env. Directorate, LLNL*

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[Corrosion by Heat-Stable Salts in Amine-based CO₂ Capture Unit](#)

Amornvadee (Amy) Veawab (Univ. of Regina, Canada), Winyu Tanthapanichakoon

[Aqua Ammonia Process for Greenhouse and Acid Gas Reduction](#)

James T. Yeh (NETL), H. W. Pennline, K. P. Resnik

Case Studies

[Case Studies Agenda](#)

[An Innovative Highly-efficient Combined Cycle for Fossil and Biomass Fuel Power Generation and Hydrogen Production with Zero CO₂ Emission](#)

Meyer Steinberg (BNL)

[Regional Projections of Temperature and Precipitation for Alternative GCMs and SRES Emission Scenarios](#)

Roman Corobov (CRDF Project, Moldova), A. Fisher, A. Nicolenco, E. Nizeyimana, B. Yarnal

[The Carbon Capture Project \(CCP\) Storage, Monitoring and Verification \(SMV\) Team: Integration of Technical Results](#)

Scott Imbus (Chevron Texaco)

[Market Value of Early Action in Carbon Sequestration](#)

Patrick R. Esposito II (Augusta Systems), Michelle I. Varga

[Health Effects of Acute and Prolonged CO₂ Exposure in Normal and Sensitive Populations](#)

Susan A. Rice (Susan A. Rice and Assoc.)

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Case Studies (continued)

A Novel Approach to the Economical Capture and Utilization of CO₂ from Fossil Fuel Power Generation Combined with Renewable Hydrogen Production

Danny Day (Eprida, Inc.), Robert J. Evans, James Weifu Lee

How Does the Media See Carbon Sequestration and What Does That Tell Us About the Future Deployment of This Technology?

Neeraj Gupta (Battelle-submitter only), Authors: Judith Bradbury, Jim Dooley

CO₂ Life Cycle Analysis? Steam Methane Reforming

Richard D. Doctor (Argonne Nat'l Lab.), John C. Molburg

Thermodynamic Analysis of Coal-based Zero-Emission Power Plant

Joel Martinez-Frias (LLNL), Salvador M. Aceves, J. Ray Smith, Harry Brandt

Zero Emission Fuel-fired Power Plant with Ion Transport Membrane

E. Yantovski (Independent Researcher, Germany), J. Gorski, D. Smyth, J. ten Elsof

Geologic

Geologic Agenda

Mineral Trapping of CO₂ with Oriskany Brine

Y. Soong (NETL), J. R. Jones, D. K. Harrison, A. L. Goodman, J. P. Baltrus

Carbon Dioxide Sequestration in Salt Caverns: Capacity and Long-term Fate

Stefan Bachu (Alberta Geological Survey), Leo Rothenburg, Maurice B. Dusseault

Effects of In-Situ Conditions on Aquifer Capacity for CO₂ Sequestration in Solution

Stefan Bachu (Alberta Geological Survey), J. J. Adams

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Optimization of CO₂ Sequestered as a Residual Phase in Brine-Saturated Formations

Mark H. Holtz (Univ. of Texas-Austin)

Comparison of Numerical Simulators for Greenhouse Gas Sequestration in Coalbeds Part III: More Complex Problems

David H.S. Law (Alberta Research Council, Canada), L.G.H. van der Meer, W. D. Gunter

Can We Sequester Large Quantities of Atmospheric Carbon in the Arctic Permafrost?

Alex T. Wilson (Univ. of Arizona)

Analysis of the Devonian Black Shale in Kentucky for Potential Carbon Dioxide Sequestration and Enhanced Natural Gas Production (U.S. DOE DE-FC26-02NT41442)

Brandon C. Nuttall (Univ. of Kentucky), James A. Drahovzal, Cortland F. Eble, R. Marc Bustin

A Special Autoclave Apparatus for Measuring Coal/Gas Properties and Interactions at Elevated Temperatures and Pressures

James G. Blencoe (ORNL), Michael T. Naney, Lawrence M. Anovitz

Design of Sensor Networks for Monitoring Ultra-low Fluxes of CO₂ at Sequestration Sites using Tracers

Prasad Saripalli (Pacific Northwest National Laboratory), James Amonette, Oleg Egorov, Justin McIntyre

Carbon Isotope Evidence for CO₂ Dissolution and Fluid-rock Interaction at the Weyburn CO₂-injection Enhanced Oil Recovery Site, Saskatchewan, Canada

Maurice Shevalier, I. Hutcheon, B. Mayer, W. Gunter, E. Perkins, Kyle Durocher

A Framework to Estimate CO₂ Leakage Associated with Geological Storage in Mature Sedimentary Basins

Michael A. Celia (Princeton University), Stefan Bachu, Sarah Gasda

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[CO2 Injection Potential Beneath Large Power Plants in the Colorado Plateau-Southern Rocky Mountain Region, USA](#)

Rick Allis (Utah Geological Survey), T. C. Chidsey, C. Morgan, J. Moore, S. P. White

[Investigations of CO2 Mobility in Natural Reservoirs Beneath the Colorado Plateau and Southern Rocky Mountains](#)

Joseph Moore (Univ. of Utah), Richard Allis, Susan Lutz, Michael Adams

[High Pressure Flow-Through Column for Assessing Subsurface Carbon Sequestration](#)

L. Suzanne Fisher (ORNL), D. Cole, J. Blencoe, G. R. Moline, J. Parker, T. J. Phelps

[Carbon Dioxide Injectivity in Brine Reservoirs Using Horizontal Wells](#)

Sinisha A. Jikich (NETL), W. Neal Sams, Grant Bromhal, Gary Pope, Neeraj Gupta, Duane H. Smith

[Ferric Iron Minerals as Geologic Traps for CO2 Sequestration: Iron Reduction Using Sulfur-Bearing Waste Gas](#)

James Palandri (USGS), Yousif K. Kharaka

[CO2 Sequestration in the Frio FM tx: Evaluation of the Impact of CO2, Co-contaminant Gas, Aqueous Fluid and Reservoir Rock Interactions](#)

Kevin G. Knauss (Lawrence Livermore), James W. Johnson, Carl J. Steefel

[An Organic Geochemical Assessment of CO2-Coal Interactions During Sequestration](#)

Jonathan J. Kolak (USGA), Robert C. Burruss

[Characterization of a Sandstone CO2 Repository: The Shattuck Sandstone](#)

John C. Lorenz (Sandia) Scott P. Cooper

[CO2 Sequestration in Bedded Sandstone-shale Sequences](#)

Tianfu Xu (Lawrence Berkeley), John A. Apps, Karsten Pruess

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[Petroleum Traps as CO2 Sequestration Sites: Assessing the Number and Size for Long-term CO2 Storage](#)

Robert C. Burruss (USGS), Sean T. Brennan, Amanda Glazebrook

[Pore-Level Modeling of Geologic Sequestration in Porous Media: When Does the Injected Carbon Dioxide Exhibit Fractal Fingering vs. Piston-like Displacement?](#)

Grant S. Bromhal (NETL), M. Ferer, Duane H. Smith

[Reservoir Simulations for Designing Coal Seam Sequestration Projects](#)

Grant S. Bromhal (NETL), W. Neal Sams, Sinisha Jikich, Olufemi Odusote, Turgay Ertekin, Duane H. Smith

Reservoir Mapping of Natural CO2 Fields: Analogs for CO2 Sequestration

Mark Rogers (Advanced Resources International), Scott Tye, Scott Stevens

[Subsurface Sensitivity Study of Geologic CO2 Sequestration in Saline Formations](#)

Ian Taggart (ChevronTexco Australia) Matthew Flett, Jason A. Lewis

[Calculating Pressure Buildup at CO2 Injection Wells in Brine Formations](#)

Sally M. Benson (Lawrence Berkeley)

Geologic Carbon Sequestration Opportunities in the Appalachian Basin

C. David Locke (Augusta Systems), Patrick R. Esposito, William A. Schuller, C. W. Byrer

Geologic Sequestration of CO2 in a Depleted Oil Reservoir

Norman R. Warpinski (Sandia), Rajesh J. Pawar, Reid B. Griff, Bruce Stubbs

Geologic Aspects of Carbon Dioxide Storage for a Power Plant Location Along the Ohio River Valley

Neeraj Gupta (Battelle), Joel Sminchak, Mark Baranoski, Lloyd M. English, John Massey-Norton

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Developing Plans and Specifications for a Deep Test Boring for CO₂ Storage in the Ohio River Valley Region

Neeraj Gupta (Battelle), Philip Jagucki, Danielle Meggyesy, Chris Long, Austin Boyd, T. S. Ramakrishnan, William Rike

Reactive Transport modeling of long-term Cap Rock Integrity during CO₂ Injection for EOR or Saline-Aquifer Storage

James W. Johnson (LLNL), John J. Nitao, Joseph P. Morris

Geologic Sequestration in Wyoming-Filling up the Big Empty

Dag Nummedal (Univ. of Wyoming), Julio Friedmann, Vicki Stamp

Concurrent Flow Calorimetric, Dew-point Hygrometric, and Non-dispersive Infrared Analyses of the Production of Methane and/or the Sequestration of CO₂ by Coal Under Dynamic (Flow-through) Conditions

Kenneth Jones (NETL)

Numerical Modeling of CO₂ Sequestration in a Depleted Oil Reservoir

Rajesh Pawar (LANL), Norm Warpinski, Bruce Stubbs, Don Zhang

Ocean Dynamics

Ocean Dynamics Agenda

Downwelling Ocean Currents

Songjian Zhou (Univ. of Alberta, Canada), Peter Flynn

An Overview of Ocean Carbon Storage Options

Ken Caldeira (LLNL)

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Robert P. Warzinski (NETL), Ronald J. Lynn, Igor V. Haljasmaa, Anne M. Robertson

[Limestone Emulsion to Alleviate Concerns about Deep Ocean Storage of CO₂](#)

Dan Golomb (Univ. of Mass), E. Barry, D. Ryan, C. Lawton, P. Swett, D. Arora

[Development of a New CO₂ Injection Process via Kenics-type Static Mixer for the Ocean Disposal of Liquid CO₂](#)

Hideo Tajima (Nat'l Inst. of Adv. Ind. Science and Tech., Japan), Ho Teng, Akihiro Yamasaki, Fumio Kiyono

[Applications of Lagrangian Techniques in Evaluating Ocean Carbon Sequestration](#)

E. Eric Adams (MIT), Peter H. Israelsson

[Engineering Carbon Sequestration in the Ocean](#)

Ian S. F. Jones (Univ. of Sydney, Australia), Chien Hsing Lu

Terrestrial

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[Carbon Sequestration Enhancing Agrochemical Products](#)

Peter S. Carlson (Comcast)

[Biogeochemical Processes Utilizing Fly Ash for Carbon Sequestration](#)

Yul Roh (ORNL), R. J. Lauf, T. J. Phelps

[Fly Ash Amendments Catalyze Soil Carbon Sequestration](#)

James E. Amonette (Pacific Northwest Nat'l Lab.), Jungbae Kim, Colleen K. Russell, Anthony V. Palumbo, W. Lee Daniels

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[Estimating Soil CO₂ Efflux in Managed Loblolly Pine Ecosystems: What We Know and How We Can Apply It to Enhancing Carbon Sequestration](#)

John Seller (VA Tech), Chris Gough, Marcus Selig, Chris Maier

[Comparing Short-term C Metabolism in Soils from Four Different Ecosystems](#)

Vanessa L. Bailey (Pacific Northwest Nat'l Lab.), J. L. Smith, H. Bolton, Jr.

[Soil Carbon Inputs from a Chronosequence of Decaying Roots Determined by Pyrolysis Mass Spectrometry](#)

Kim Ludovici (USDA Forest Service), Kim Magrini, Robert Evans

[First Principles Simulation Studies of Mineral Carbonation Reaction Processes in Serpentine](#)

Andrew V. G. Chizmeshya (Arizona State Univ.), Michael J. McKelvy, George H. Wolf, Deirdre Gormley

[New Mechanisms for Enhancing C Sequestration by Soils](#)

Alvin J. M. Smucker (Argonne National Laboratory), E. J. Park

[Rapid Assessment of Soil Organic Matter Using Pyrolysis Molecular Beam Mass Spectrometry](#)

Coeli Hoover (USDA Forest Service), K. Magrini, B. Evans, M. Davis, M. Looker

[Soil Physical Quality of Reclaimed Mined Soil Using FGD Products](#)

Manoj K. Shukla (Ohio State Univ.), R. Lal, M. Ebinger

[Down Woody Materials in Eastern U.S. Forests](#)

David C. Chojnacky (USDA Forest Service), Robert A. Mickler, Linda S. Heath

[Consortium for Agricultural Soils Mitigation of Greenhouse Gases \(CASMGs\)](#)

Charles W. Rice (Kansas State Univ.), S. Capalbo, Rattan Lal, N. Clarke, C. Izaurralde, C. Kling, K. Paustian, P. Robertson, R. Turco, S. Verma

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Non-invasive In-Situ Carbon Monitoring in Soil

Lucian Wielopolski (Brookhaven National Lab.), Sudeep Mitra, George Hendrey

Enhanced Practical Photosynthetic CO₂ Mitigation

David Bayless (Ohio Coal Research Center), Gregory Kremer, Morgan Vis, Ben Stuart, Michael Prudich, Keith Cooksey, Jeff Muhs

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